

UNITED STATES PATENT OFFICE.

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DYNAMO-ELECTRIC MACHINE.

No. 926,225.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOSEPH A. WILLIAMS, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Dynamo-Electric Machines, of which the following is a full, clear, and exact description.

The object of the present invention is to provide an improved form of generator, designed particularly for use in connection with explosive engines to produce ignition sparks, although it is clear that the invention is capable of much wider application.

A further object is to produce a generator which, in addition to being simple in construction, is of a stable character and is capable of producing an increased number of alternations of flow of the magnetic lines of force for each revolution, and consequently, many alternations of the induced current in the armature winding.

The invention involves the combination, with the pole pieces and their magnets, of an armature, consisting of windings and a core made of magnetic material passing through said windings and mounted so as to rotate upon an axis which is substantially coincident with the axis of the axis of the windings, said core being provided with a plurality of wings which are arranged one-half on one side and the other half on the opposite side of the armature windings and are so disposed that when any wing on one side of said windings is in juxtaposition with one pole, a wing on the other side of said windings is in juxtaposition with a pole of opposite sign.

The invention further involves an electric generator having the characteristics referred to when the armature windings are upon a non-rotatable spool, and it further involves details of construction as shown in the drawing and hereinafter described and claimed.

In the drawings, Figure 1 is a side elevation of a machine embodying the invention, the windings being shown partly in section. Fig. 2 is a top plan view of the machine shown in Fig. 1, one of the magnets being broken away. Fig. 3 is an end elevation, one of the magnets being broken away. Fig. 4 is a detail sectional view taken on the line 4—4 of Fig. 1. Fig. 5 is a sectional view taken on the line 5—5 of Fig. 1.

Referring to the drawings, N and S represent respectively, the north and south pole

pieces of the magnets A' A², which magnets may be permanent magnets or electro-magnets, as desired. The pole pieces are so disposed that the pieces at the opposite ends of the same side of the machine are of opposite polarity and the pieces on the opposite sides of the same end are of opposite polarity. The faces of said pole pieces are curved about the axis of the core D as a center and the centers of said pole faces on opposite sides at the same end are substantially 90° apart, and the centers of the faces on the same side are practically in a line parallel with the axis of the core D.

D represents the armature core and E the armature windings, said windings consisting of an insulating spool and wire coils wound thereon. The armature core is rotatably mounted between the curved faces of the pole pieces and upon an axis which is coincident with the axis of curvature of said pole pieces, and said core passes through the armature windings, that is to say, through the spool and the wire coils thereon so that its axis of rotation is substantially coincident with the axis of said windings. C C represent the bearings in which said armature core is mounted.

In the construction shown, the windings, that is to say, the spool and the coils thereon, are stationary, the spool being fixed to a suitable support C'. It is not, however, of the essence of the broad invention that these windings shall be non-rotatable, although it is a desired feature of construction.

The core, which must be made of magnetic material, preferably soft iron, is provided with four radiating wings D' D² D³ and D⁴. The wings D' D² are at one end of the spool and the other two wings, namely, D³ D⁴ are at the other end thereof. The wings D' and D² extend in the same direction in the same diametrical plane, while the wings D³ and D⁴ extend in the diametrically opposite direction, and, therefore, in the same diametrical plane.

The pole pieces and wings being arranged as described, it is evident that when one of the wings, as for example the wing D', is in juxtaposition to the face of one pole piece, the end of the wing D³ which extends in the same plane and in the same direction from the core but at the opposite end thereof, will be in juxtaposition to the face of another pole piece of the opposite sign. The magnetic lines of force flowing from the north